

## IC5.5: Optional Job Sheet

### The Structure of TROWALS

**Objective:** Examine a winter weather case, and using the knowledge gained from the IC 5 Lesson 5 training module, identify a TROWAL and predict its evolution.

**Data:** 1 March 2004 winter storm event in the High Plains. You will be using your WES machine in case review mode.

**Instructions:**

On your WES machine, load the 1 March 2004 case, GID localization, and set the clock to 07 UTC March 1, 2004. **You will be examining the NAM 80 06 UTC initialization for each question.**

On a plan view at the regional scale, load NAM 80 mslp, surface isotherms, metars, and surface winds, then toggle between overlays of wind vectors and  $\theta_e$  at three pressure levels: 925mb, 850mb, and 700mb.

**Question 1. Is there a surface occluded front? YES/NO (Circle one) If so, where is it located?**

**Question 2. Is there evidence of a TROWAL in this image?**

Swap panes and load a plan view at the regional scale of NAM 80 pressure on a 305K equivalent potential temperature surface, overlaid with winds and saturated equivalent geostrophic potential vorticity ( $MPV_g$ ) from 700-500 mb.

**Question 3. Where is the trowel in this image?**

TROWAL Location: \_\_\_\_\_

**Question 4. How are the placement and/or structure of the TROWAL different from what you saw with the constant pressure plot?**

**Question 5. Where within the TROWAL is the strongest upward forcing signal, and qualitatively how strong is it?**

**Question 6. Is there any instability present in the TROWAL? If so, where?**

Cut a cross section through the TROWAL, roughly from E. Nebraska north-northwest into southwest Manitoba. Load NAM 80 equivalent potential temperature and 2-D frontogenesis.

**Question 7. Explain what the TROWAL looks like in the cross section. Mention if the temperature gradient is larger on one side or the other.**

Finally, load a NAM 80 plan view on the regional scale of the 305 K equivalent potential temperature surface map with pressure, overlaid with 925, 850 and 500 mb 2-D frontogenesis.

**Question 8. Where would the heaviest snow fall? Explain your reasoning.**

**An answer key is available for this job sheet. Please see your local AWOC Winter Weather facilitator to obtain a copy.**